BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	

RESPONSES OF
ZERO EMISSIONS LEASING LLC
TO INFORMATION REQUESTS
OF PUBLIC UTILITIES COMMISSION,
DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM,
HECO COMPANIES
AND TAWHIRI POWER LLC

AND

CERTIFICATE OF SERVICE

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ZERO EMISSIONS LEASING LLC ("Zero Emissions") respectfully submits the following responses to the Information Requests ("IRs") of the PUBLIC UTILITIES COMMISSION (the "Commission"), the STATE OF HAWAII DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM ("DBEDT"), HAWAIIAN ELECTRIC COMPANY, INC., MAUI ELECTRIC COMPANY, LIMITED and HAWAII ELECTRIC LIGHT COMPANY, INC. (the "HECO Companies") and TAWHIRI POWER LLC ("Tawhiri") in the above-referenced proceeding:

Responses by Zero Emissions to IRs of Public Utilities Commission

PUC/ZEL-IR-59

On a $/kW basis, what interconnection costs have you experience or do you anticipate for solar PV and solar thermal projects in Hawaii? Please describe how these costs vary by location, technology, and system size.

Response: Interconnection costs for solar PV projects in Hawaii depend primarily on the size of the PV system, the location of the PV system relative to the nearest interconnection point with the grid, and the transmission and distribution capacity of the grid at that interconnection point. Small (< 100 kW) solar PV projects, interconnected with distribution circuits on which distributed customer-generation is less than 10% of the circuit load, are not likely to have any significant interconnection costs. Larger (> 100 kW) solar PV projects, or solar PV projects interconnected on circuits where distributed customer-generation is more than 10% of the circuit load, are more likely to be subject to interconnection study costs and the costs of improvements to the grid based on such studies. Such costs vary on a project-by-project basis, and it is difficult to say whether there is a typical or average PV solar project interconnection cost that correlates with PV solar project size or location.

PUC/ZEL-IR-60

Based on your experience, how much more expensive in $/kW are solar modules in Hawaii than is typical in the mainland United States? Please describe such differences in detail. Is this difference changing or likely to persist?

Response: Solar modules in Hawaii are approximately 15% to 20% more expensive than is typical in the mainland United States, depending on the weight and framing of the modules. This cost difference is primarily due to higher costs of transportation to and storage in Hawaii. Such cost differences are likely to persist over time.

PUC/ZEL-IR-61

Based on your experience, due to the cost of land, permitting and labor, how much more expensive on a $/kW basis, are solar PV and solar thermal systems in Hawaii to develop than is typical in the mainland United States? Please describe such differences in detail. Is this difference changing or likely to persist?

Response: Solar PV systems in Hawaii are approximately 25% to 30% more expensive to develop than is typical in the mainland United States. This cost difference is primarily due to higher labor costs, higher permitting costs and higher overhead costs of doing business in Hawaii. Such cost differences are likely to persist over time.

PUC/ZEL-IR-62

Please describe any environmental regulations, zoning ordinances, and other barriers to the development of solar PV or solar thermal systems on Oahu.

Response: The primary barriers to the development of solar PV systems on Oahu are: (1) the competitive bidding framework, which discourages the development of large-scale solar PV projects that produce solar electricity for utility transmission and distribution, and (2) the 100 kW system size limit on net energy metering, which discourages the development of solar PV systems greater than 100 kW for customer self-generation.

Responses by Zero Emissions to IRs of DBEDT

DBEDT/ZEL-IR-1

Please provide all the workpapers and data used to determine the proposed feed-in tariff rates in the referenced pages.

Response: The proposed feed-in tariff rates for the following renewable resources and renewable energy generating facilities were obtained from the feed-in tariff schedule in effect in Germany as of September 2008[1], converted from Euros into US Dollars at the exchange rate of €.6812:$1.0000 quoted as of September 23, 2008[2]:

Biomass: Wood-Burning Generating Facility
Biogas: Renewable Energy Generating Facility
Geothermal Energy: Renewable Energy Generating Facility
Landfill Gas or Sewage Treatment Gas: Renewable Energy Generating Facility
Hydropower: Renewable Energy Generating Facility
Wind: Offshore Wind Generating Facility
Wind: Onshore Wind Generating Facility

The proposed feed-in tariff rates for Biomass: Non-Wood Burning Generating Facility were furnished by Alexander & Baldwin/Hawaiian Commercial & Sugar Division.

The proposed feed-in tariff rates for Solar Radiation: Photovoltaic Generating Facility for each of the islands were furnished by The Solar Alliance, in consultation with Hawaii Solar Energy Association and Zero Emissions. These proposed rates represent good faith estimates of 20-year level feed-in tariff rates necessary to attract development capital for projects typical of the Electrical Capacity size ranges shown in Zero Emissions' Proposal for a Feed-in Tariff ("Zero Emissions FIT Proposal").

On information and belief, the proposed feed-in tariff rates for Solar Radiation: Concentrating Solar Power Facility for each of the islands were furnished by Sopogy, Inc.

[1] The Germany feed-in tariff rates were obtained from the Tables of Renewable Tariffs or Feed-in Tariffs Worldwide published by Wind-Works.org at http://www.wind-works.org/FeedLaws/TableofRenewableTariffsorFeed-InTariffsWorldwide.html

[2] Yahoo! Finance Currency Converter (September 23, 2008).

Responses by Zero Emissions to IRs of the HECO Companies

HECO/ZEL-IR-1

Do you agree that in addition to achieving a greater level of renewable energy for the State, reliability, power quality and ratepayer impacts are important considerations that must be addressed as a part of any feed-in tariff (FIT) design? If not, please discuss why not.

Response: No. A feed-in tariff is a *price* specification designed to economically motivate the rapid development of renewable energy generation. The economic benefits and costs to the public, including ratepayer impacts, of the feed-in tariff, as a price specification, need to be considered in relation to the economic benefits and costs to the public of the competitive bidding framework now in effect for specifying the price of renewable energy.

The feed-in tariff is not a *technical* specification for interconnection of renewable energy generation. Reliability and power quality impacts from the interconnection of renewable energy generation are not, therefore, a consideration in the design of a feed-in tariff, except that Zero Emissions' FIT Proposal acknowledges the utility's right to insist that *any* generation – whether economically motivated by the FIT or not -- meet the utility's own technical interconnection requirements *before* the system is interconnected, so that the utility may fulfill its legal obligation to insure that such reliability and power quality are maintained .

HECO/ZEL-IR-2

Do you agree that the HECO, MECO and HELCO systems have different technical and reliability considerations? If not, please discuss why not.

Response: Yes.

HECO/ZEL-IR-3

Do you agree that due to the existing and/or anticipated levels of intermittent renewable resources on each island system, that there may be technical and/or operational constraints upon the amount of additional intermittent renewable energy that each island system can absorb? If not, please discuss why not.

Response: No. The IR implies that the transmission and distribution capacity cannot be modified or expanded to "absorb" existing and/or anticipated levels of intermittent renewable resources. While there may be *economic* constraints upon the amount of additional intermittent renewable energy that each island electric system can be modified to absorb, Zero Emissions is not aware of any insurmountable technical and/or operational constraints upon the amount of additional intermittent renewable energy that each island electric system can be modified to absorb.

HECO/ZEL-IR-4

How does your FIT proposal insure that reliability and power quality on each island electric system are maintained?

Response: The IR implies that Zero Emissions, as proponent of an FIT proposal, is legally obligated to insure that reliability and power quality on each island system are maintained. The utility, not Zero Emissions as proponent of an FIT proposal, is legally obligated to insure that reliability and power quality on each island system are maintained. Zero Emissions' FIT proposal insures that such reliability and power quality are maintained by acknowledging the utility's right to insist that *any* generation – whether economically motivated by the FIT or not -- meet the utility's own technical interconnection requirements *before* the system is interconnected, so that the utility may fulfill its legal obligation to insure that such reliability and power quality are maintained.

HECO/ZEL-IR-5

What specific data, evaluations, studies or analyses did you rely upon as a part of any conclusion that your FIT proposal insures reliability on each island system? Please provide that data, evaluations, studies and/or analyses to the extent they are available.

Response: The IR implies that Zero Emissions, as proponent of an FIT proposal, is legally obligated to insure reliability on each island system. The utility, not Zero Emissions as proponent of an FIT proposal, is legally obligated to insure such reliability. Zero Emissions' FIT proposal insures such reliability by acknowledging the utility's right to insist that *any* generation – whether economically motivated by the FiT or not -- meet the utility's own technical interconnection requirements *before* the system is interconnected, so that the utility may fulfill its legal obligation to insure such reliability.

Data, evaluations, studies and/or analyses of the kind requested are irrelevant to establishing the points of law that: (1) the utility is legally obligated to insure reliability on each island system, and (2) the utility has a right to insist that any generation – whether economically motivated by the FiT or not -- meet the utility's own technical interconnection requirements before the generation is interconnected, so that the utility may fulfill its legal obligation to insure such reliability.

HECO/ZEL-IR-6

As variable generation is presently having an adverse impact on a system's reliability, how would your FIT proposal mitigate any further adverse impacts?

Response: The IR implies that Zero Emissions, as proponent of an FIT proposal, is legally obligated to mitigate any adverse impacts on system reliability caused by additions of variable generation that are economically motivated by an FIT. The utility, not Zero Emissions as proponent of an FIT proposal, is legally obligated to mitigate any such impacts. Zero Emissions' FIT proposal mitigates any such impacts by acknowledging the utility's right to insist that *any* generation – whether variable or fixed, whether economically motivated by the FIT or not -- meet the utility's own technical interconnection requirements *before* the generation is interconnected, so that the utility may fulfill its legal obligation to mitigate any such impacts.

HECO/ZEL-IR-7

Do you agree that your FIT proposal could result in increases in the rates paid by utility ratepayers? If so, what do you view as an acceptable level of increase for each of the utility system's ratepayers? What do you base that opinion on? Please provide any evaluations or analyses or studies used to support this opinion.

Response: Zero Emissions' FIT proposal could result in increases or decreases in the rates paid by utility ratepayers. An acceptable level of increases or decreases in such rates is one consistent with rapid development of large-scale renewable energy generation that reduces -- as much as possible and as soon as possible -- the cost to the public of Hawaii's reliance on petroleum for electric power generation. *See* Zero Emissions' Response to HECO/ZEL-IR-24, *infra*.

HECO/ZEL-IR-8

How does your FIT proposal insure that ratepayers within each of the three utility service territories do not receive significant rate increases?

Response: The IR assumes that a FIT proposal that results in no significant rate increases from the addition of renewable energy generation will have the lowest cost to the public, but that assumption ignores the potentially catastrophic cost to the public from a failure to establish a feed-in tariff that encourages rapid development of large-scale renewable energy generation to reduce – as much as possible and as soon as possible – the cost to the public from Hawaii's dependence on petroleum for electric power generation. Zero Emissions' FIT Proposal anticipates insignificant rate increases and low cost to the ratepaying public (*see* Zero Emissions' Response to HECO/ZEL-IR-24, *infra*).

HECO/ZEL-IR-9

What specific data, evaluations, studies or analyses did you rely upon as a part of any conclusion that your FIT proposal insures that ratepayers within each of the three utility service territories do not receive significant rate increases? Please provide that data, evaluations, studies and/or analyses to the extent they are available.

Response: Zero Emissions has not posited any such conclusion. *See, however,* Zero Emissions' Response to HECO/ZEL-IR-24, *infra*.

HECO/ZEL-IR-10

Do you agree that competitive bidding can provide benefits to ratepayers? If so, how does your proposal insure that ratepayers receive the benefits that competitive bidding can provide?

Response: Competitive bidding can provide benefits and costs to ratepayers. So can a feed-in tariff. Zero Emissions' proposal would replace competitive bidding with a FIT because the total benefits to the public of Zero Emissions' proposed FIT are greater than the total benefits to the public of competitive bidding, and because the total costs to the public of Zero Emissions' proposed FIT are less than the total costs to the public of competitive bidding.

HECO/ZEL-IR-11

Please explain why a feed in tariff should be applied to larger resources, rather than competitively bid to assure ratepayers the lowest prices for significant blocks of renewable energy?

Response: A feed-in tariff should be applied to larger resources, rather than competitive bidding, because feed-in tariffs have proven successful in Germany and other nations in encouraging the rapid development of large-scale renewable energy generation at low cost to the public, whereas competitive bidding has not been proven successful anywhere in encouraging such development.

HECO/ZEL-IR-12

Do you agree that if a Renewable Energy Generating Facility is unable to meet the technical requirements set forth in the utilities' rules relating to interconnection with the utility's electric system, that Renewable Energy Generating Facility should not be interconnected with the utility's electric system? If not, please discuss why not.

Response: No. If a Renewable Energy Generating Facility is unable to meet the technical requirements set forth in the utilities' rules relating to interconnection with the utility's electric system, that Renewable Energy Generating Facility *may* not be interconnected with the utility's electric system.

HECO/ZEL-IR-13

Do you agree that, as an electric system must remain in balance, if there is a greater amount of energy being generated in relation to load being served that generation must be reduced or curtailed to achieve system balance (assuming that load cannot be increased)? If not, please describe how the system balance can otherwise be achieved.

Response: The IR is vague and misleading because it does not specify the conditions under which the utility's electric system "must remain in balance."

If the IR means the balance between generation and load that must be maintained to restore the physical stability and operation of the electric system after an outage, then the answer is "Yes."

If the IR means a balance between generation and load that minimizes the utility's operating costs, then the answer is "No" because, while the minimization of such costs through curtailment may be desirable for economic reasons, such minimization is not necessary for the physical stability or "balance" of the electric system.

"System balance" – whether in the physical stability sense or the economic cost minimization sense – can be achieved by curtailment or dispatch of generation or load.

HECO/ZEL-IR-14

Please explain how your proposal to require the utility to take all renewable energy generated by a FIT resource regardless of system need assures system balance and stability?

Response: The IR is vague and misleading because it does not specify what is meant by "system balance and stability."

If the IR means "system balance and stability" in the physical stability sense, Zero Emissions' FIT Proposal would acknowledge the utility's right to curtail generation under conditions like those cited in Section 5 (Continuity of Service), Section 6 (Personnel and System Safety) and Section 7 (Prevention of Interference) of the draft Schedule FIT Agreement attached as Appendix I to the straw Schedule FIT Tariff furnished by HECO to the parties on January 15, 2009 (the "HECO Straw FIT Agreement").

If the IR means "system balance and stability" in the economic cost minimization sense, then Zero Emissions' FIT Proposal obliges the utility to achieve an economic "system balance" by methods other than curtailment of FIT renewable generation, unless the FIT renewable generator contractually agrees to give the utility a right to curtail the generator's renewable generation.

HECO/ZEL-IR-15

Is it your position that FIT resources may not be curtailed under any circumstance? If there are circumstances under which a FIT resource may be curtailed, please explain in detail how that curtailment would be accomplished. Please explain in detail how existing renewable projects fit into any curtailment order and the basis for assigning a lower curtailment priority to existing renewable resources.

Response: No. A renewable energy generator that receives a FIT rate may be curtailed under two circumstances.

First, such a generator may be curtailed under conditions like those cited in those cited in Section 5 (Continuity of Service), Section 6 (Personnel and System Safety) and Section 7 (Prevention of Interference) of the HECO Straw FIT Agreement. Such curtailment may occur at any time and is not part of any order or priority for curtailment.

Second, such a generator may be curtailed if the generator contractually agrees with the utility to modify the utility's obligations, under the proposed FIT, to take, purchase and pay for all the renewable energy generated by the generator and delivered to the utility. The generator has a right, but not an obligation, to enter into such a contract with the utility. Zero Emissions does not propose any order or priority for such curtailment relative to curtailment of existing renewable resources.

HECO/ZEL-IR-16

Please provide any evaluations, studies or analyses to support the following in your FIT proposal: (1) the inclusion of each renewable resource type; (2) the viability of each renewable resource type for each island system; (3) the project size demarcations for each

renewable resource type; (4) the viability of each project size for each island system; and (5) the basis for a different or separate rate for each size demarcation (if applicable). This should include any information or evidence that you may have on the general or specific plans of any renewable resource developer to develop renewable resources of this type, and including the anticipated size of the project, on any island system within the next one, three and five years.

Response: Zero Emissions' proposed FIT is modeled after the German feed-in tariff that has proven successful in encouraging the rapid development of large-scale renewable energy generation at low cost to the public. As a result of the German FIT, Germany now obtains more than 14% of its electricity from renewable sources – primarily wind and solar PV.

The inclusion of each renewable resource type, the project size demarcations for each renewable resource type, and the basis for a different or separate rate for each size demarcation are supported by the following evaluations, studies and analyses showing the success of the same or similar resource types, project size demarcations and rates under the German FIT:

German Federal Environment Ministry, *Development of Renewable Energy Sources in Germany in 2007* (December 15, 2008) http://www.bmu.de/files/pdfs/allgemein/application/pdf/ee_zahlen_2007_en_update.pdf

World Future Council, *Feed-In Tariffs – Boosting Energy for our Future* (June 2007) http://www.hermannscheer.de/en/images/stories/pdf/WFC_Feed-in_Tariffs_jun07.pdf

European Photovoltaic Industry Association, *Supporting Solar Photovoltaic Electricity: An Argument for Feed-in Tariffs* (January 2008) http://www.epia.org/fileadmin/EPIA_docs/documents/An_Argument_for_Feed-in_Tariffs.pdf

European Photovoltaic Industry Association, *European PV Association's Position Paper On A Feed-In Tariff For Photovoltaic Solar Electricity* (2005) http://www.wind-works.org/FeedLaws/EuropeFeedInTariffEPIA.pdf

European Photovoltaic Industry Association, *Overview of European PV support schemes* (December 17, 2008) http://www.epia.org/fileadmin/EPIA_docs/documents/20081215_EPIA_EU_support_schemes_overview-PUBLIC.pdf

Paul Gipe, *Renewable Energy Policy Mechanisms* (February 17, 2006) http://www.wind-works.org/FeedLaws/RenewableEnergyPolicyMechanismsbyPaulGipe.pdf

The viability of each renewable resource type for each island and the viability of each project size for each island system are supported by the following evaluations, studies and analyses:

Douglas Hinrichs, *Feed-in Tariff Case Studies: A White Paper in Support of the Hawaii Clean Energy Initiative* (Sentech, Inc. September 2008).

Global Energy Concepts LLC, *A Catalog of Potential Sites for Renewable Energy in Hawaii* (Department of Business Economic Development and Tourism, December 2006) http://hawaii.gov/dbedt/info/energy/publications/cpsre07.pdf

Global Energy Concepts LLC, *Select Hawaii Renewable Energy Project Cost and Performance Estimates, 2004* (Department of Business Economic development and Tourism 2004) http://hawaii.gov/dbedt/info/energy/publications/shrep04.pdf

HECO/ZEL-IR-17

Please describe the methodology and rationale used to determine the proposed twenty (20) year terms in your FIT proposal for each technology. Please provide any evaluations, studies or analyses to support the proposed 20 years terms for each technology listed.

Response: The proposed twenty (20) year terms in Zero Emissions' FIT Proposal are is modeled after the 20-year terms of the German feed-in tariff that has proven successful in encouraging the rapid development of large-scale renewable energy generation at low cost to the ratepaying public.

HECO/ZEL-IR-18

Please provide the bases for the proposed penetration limits for intermittent renewable energy sources. Please provide any evaluations, studies or analyses to support the proposed penetration limits, including in particular any evaluations, studies or analyses regarding the maintenance of system reliability at the proposed penetration limits.

Response: Island-wide grid penetration limits for intermittent renewable energy sources are based on the economic principle that it does not make sense to oblige the utility and ratepayers to pay for renewable energy from intermittent sources (solar and wind) if such sources displace no generation from imported fuels because of the need to maintain such generation to maintain present-day levels of system reliability.

A proposed aggregate island-wide penetration limit of 25% of peak demand for wind energy is based on studies[3] showing that the additional operating costs imposed on the system to maintain system reliability are moderate (from $3/MWh to $5/MWh) at wind capacity penetrations ranging up to 29%.

[3] *See* B. Parsons, M. Milligan, J.C. Smith, E. DeMeo, B. Oakleaf, K. Wolf, M. Schuerger, R. Zavadil, M. Ahlstrom and D. Yen Nakafuji, "Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States," National Renewable Energy Laboratory Conference Paper NREL/CP-500-39955 (July 2006) http://www.uwig.org/Ewec06gridpaper.pdf ; J.C. Smith, B. Parsons, T. Acker, M. Milligan, R. Zavadi, M. Schuerger and E. DeMeo, "Best Practices in Grid Integration of Variable Wind Power: Summary of Recent US Case Study Results and Mitigation Measures," presented at Europe Wind Energy Conference '07, Milan Italy (May 2007). http://www.wapa.gov/UGP/PowerMarketing/WindHydro/EWEC07paper.pdf.

A proposed aggregate island-wide penetration limit of 20% of peak demand for photovoltaic solar power is based on a studies[4] showing that, at minimum system loading of 35%, increasingly large amounts (> 50%) of photovoltaic electricity are unusable as PV penetration exceeds 20% of peak demand.

HECO/ZEL-IR-19

Please explain in detail how the proposed queuing procedures based upon those procedures proposed by the Midwest ISO would operate and be implemented for each island electric system. In particular, please provide any evaluations, studies or analyses of potential differences between the Midwest ISO service territory and the Hawaii utility electric systems and how those differences would be accommodated and addressed through your FIT proposal. Please discuss in detail whether the quality of power (steadiness, predictability, ability to enhance regulating resources on the grid and other such characteristic that are important to power reliability) should be a factor in setting the priority a project receives, and if not, why not.

Response: The Midwest ISO queuing procedure[5] could operate and be implemented for each island electric system without significant modification.

Power quality and power reliability are factors affecting whether a project meets the utility's technical requirements for interconnection and, therefore, whether it is "ready-to-interconnect," but should not themselves be a factor in determining the priority that a project receives under the utility's queue management procedure for interconnection.

HECO/ZEL-IR-20

Should a utility be entitled to use the generated output of a renewable resource in its service territory toward meeting a state or county mandated RPS standard regardless of ownership of the environmental credits? If not, please discuss why not?

Response: No. The developer who took the risk in developing the renewable energy project is entitled to the rewards of the project, including the value of any environmental

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[4] *See* P. Denholm and R.Margolis, "Very Large-Scale Deployment of Grid-Connected Solar Photovoltaics in the United States: Challenges and Opportunities," National Renewal Energy Laboratory Conference Paper NREL/CP-620-39683 (April 2006) http://www.nrel.gov/pv/pdfs/39683.pdf; Paul Denholm and Roberet M. Margolis, "Evaluating the limits of solar photovoltaics (PV) in traditional electric power systems," 35 Energy Policy 4424-4433 (Elsevier, September 2007)..

[5] *See* Midwest Independent Transmission System Operator ("Midwest ISO"), Generator Interconnection Process Tariff (August 25, 2008) http://www.midwestmarket.org/publish/Document/25f0a7_11c1022c619_-7d600a48324a/Attachment%20X%20GIP.pdf?action=download&_property=Attachment; Midwest ISO, Business Practices Manual: Generator Interconnection (Manual No. 15, TP-BPM-004-r2, January 6, 200p) http://www.midwestmarket.org/publish/Document/45c84c_11cdc615aa1_-7c010a48324a ; 124 FERC ¶ 61,183, Midwest Independent Transmission System Operator, Inc., Docket No. ER08-1169-000, Order Conditionally Accepting Tariff Revisions and Addressing Queue Reform (August 25, 2008) http://elibrary.ferc.gov/idmws/doc_info.asp?document_id=13641108; Working group for Investment in Reliable & Economic electric Systems (WIRES), Integrating Locationally-Constrained Resources Into Transmission Systems: A Survey of U.S. Practices (October 2008) http://www.wiresgroup.com/images/WIRES_Report_LCR.pdf

credits associated with the project in any market set up for the exchange of such credits. If the utility is under a state mandate to achieve certain levels of renewable energy production, then the utility should have the opportunity to develop its own renewable energy projects that, under Zero Emissions' FIT proposal, would be eligible for FIT rates on the same terms as renewable energy projects developed by independent developers.

HECO/ZEL-IR-21

Please provide any evaluations, studies, analyses or data to support the rates contained in your FIT proposal including detailed support for the applicability of those rates to the specified resources on the Hawaii utilities' island systems.

Response: *See* Zero Emissions' Response to the IRs Submitted by DBEDT, DBEDT/ZEL-IR-1.

HECO/ZEL-IR-22

Please explain how your proposed rates are affected by the key costs and operating characteristics referenced in the Commission's NRRI Scoping Paper filed December 11, 2008.

Response: The key costs and operating characteristics referenced in the Commission's NRRI Scoping Paper are relevant, but not determinative of the "right" FIT rate. The "right" FIT rate is the 20-year level rate that will attract the investment capital necessary to achieve rapid development of large-scale renewable energy generation at low cost to the public.

The "right" FIT rate necessarily will be more than these key costs, but may or may not coincide with the FIT rate that any person other than an investor believes is sufficient to obtain a "reasonable profit." The key costs set a lower bound on the "right" FIT rate, but do not account for risks such as interconnection delays, inflation, legal and regulatory uncertainties, and the utility's potential resistance to the implementation of an FIT Schedule like that proposed by Zero Emissions. Investors have to and will take all such risks into account in deciding whether to invest in the development of renewable energy projects in Hawaii.

To determine the "right" FIT rate, the Commission needs to ask the renewable energy industry participants for their good faith estimates of the right FIT rate that they believe is necessary to attract such development capital, use the key costs and operating characteristics as checks on the reasonableness of those estimates, and then adopt FIT rates based on those estimates. Whether FIT rates based on such estimates are "right" cannot and will not be known at the time they are adopted because their "rightness" depends on investors' investment decisions in the future, not on the parties' present-day subjective impressions of what is a "reasonable" profit. The "rightness" of the FIT rates adopted today will be known in 2 to 3 years, when it is seen how much renewable energy generating capacity has been called forth by these FIT rates.

HECO/ZEL-IR-23

Please provide any evaluations, studies, analyses or data to support your assertion that PBFiTs "unlimited by annual caps, production caps (curtailment), size caps and expenditure caps" are also consistent with "minimum cost to the public."

Response: *See* Zero Emissions' Response to HECO/ZEL-IR-23, *infra*.

HECO/ZEL-IR-24

Please provide any evaluations, studies, analyses or data to support your assertion that a benefit of PBFiTs are "the achievement of energy security and independence" "at minimal additional cost to utilities, ratepayers and the State of Hawaii."

Response: The Zero Emissions' FIT Proposal is modeled after the German feed-in tariff that has proven successful in Germany for achieving 14% renewable electricity generation production in 7 years at a cost to German ratepayers of about $.01/kWh. The German feed-in tariff is not limited by annual caps, production or output caps (curtailment), size caps or expenditure caps.

The net additional cost to ratepayers of the Zero Emissions' FIT Proposal, assuming the utility meets the RPS goals set forth in the Hawaii Clean Energy Agreement (40% by 2030), can be estimated as follows. In the white paper, *Feed-in Tariff Case Studies*, prepared for the U.S. Department of Energy and the State of Hawaii in support of the Hawaii Clean Energy Initiative[6], the author reports that the increased cost, as of 2008, to German ratepayers as a result of the German FIT has been €.007 (or US $.01) per kWh.[7] As of 2008, Germany had achieved approximately 14% of kWh from renewable sources, of which approximately ¾ came from wind and ¼ came from solar. If Hawaii establishes a feed-in tariff having rates similar to the German feed-in tariff over the same 20 year term, and if the Hawaii FIT is not limited by annual caps, size caps, output caps or expenditure caps (just as the German FIT is not limited), and if the Hawaii utility meets the 40% by 2030 goal using wind and solar in the same proportion as Germany, it may be estimated that the increased cost to Hawaii ratepayers as a result of the Hawaii FIT would be about $.01/kWh multiplied by 40% divided by 14%, or about $.03/kWh.

Moving Hawaii to 40% renewable energy at a cost of about $.03/kWh would be a meaningful step towards the achievement of energy security and independence for Hawaii at a minimal additional cost to utilities, ratepayers and the State of Hawaii.

HECO/ZEL-IR-25

Please explain how FIT will encourage diversity of renewable energy resources in the absence of caps.

Response: Zero Emissions' FIT proposal encourages diversity of renewable energy resources by specifying FIT rates for renewable energy generated from diverse renewable energy resources using commercially proven technologies and encouraging rapid

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[6] Douglas Hinrichs, *Feed-in Tariff Case Studies: A White Paper in Support of the Hawaii Clean Energy Initiative* (Sentech, Inc. September 2008).

[7] Marcus Maedl, "The German FIT for Renewable Energy – A Bargain!" *Renewable Energy World* (April 14, 2008) http://www.renewableenergyworld.com/rea/news/reinsider/story?id=52126

development of large-scale renewable energy generation from such resources. Annual caps, size caps, output caps (curtailment) and expenditure caps would discourage such development from diverse renewable energy resources.

Responses by Zero Emissions to IRs of Tawhiri

TPL/ZEL-IR-9

If utility generation is allowed to participate in Feed-in Tariffs (collectively "FiT"), are you proposing any safeguard to avoid a potential conflict of interest or appearance of conflict of interest with that arrangement? If so, please explain in detail what would be those safeguards? If not, please explain how the integrity of the FiT will be maintained under that scenario.

Response: Yes. The Proposal for Feed-in Tariff submitted by the Zero Emissions ("Zero Emissions' FIT Proposal") avoids potential conflict of interest or appearance of conflict of interest by (1) obliging the utility, as a transmission & distribution entity, to take, purchase and pay for renewable energy delivered by a renewable energy generator owned by the utility on the same terms as renewable energy delivered by an independent renewable energy generator, and (2) establishing a queueing procedure for interconnection priority that is uniformly applicable to renewable energy generators owned by the utility and independent renewable energy generators.

* * * *

DATED: Honolulu, Hawaii, March 13, 2009

Erik Kvam
Chief Executive Officer
Zero Emissions Leasing LLC

CERTIFICATE OF SERVICE

I hereby certify that I have this date filed and served the original and eight copies of the foregoing **RESPONSES OF ZERO EMISSIONS LEASING LLC TO INFORMATION REQUESTS OF PUBLIC UTILITIES COMMISSION, DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM, HECO COMPANIES AND TAWHIRI POWER LLC** in Docket No. 2008-0273, by hand delivery to the Commission at the following address:

CARLITO CALIBOSO
PUBLIC UTILITIES COMMISSION
465 S. King Street, Suite 103
Honolulu, HI 96813

I hereby further certify that I have this date served two copies upon the following party of the foregoing **RESPONSES OF ZERO EMISSIONS LEASING LLC TO INFORMATION REQUESTS OF PUBLIC UTILITIES COMMISSION, DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM, HECO COMPANIES AND TAWHIRI POWER LLC** in Docket No. 2008-0273, by causing such copies to be mailed, postage prepaid, and properly addressed to each such party as follows:

CATHERINE P. AWAKUNI
DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS
DIVISION OF CONSUMER ADVOCACY
P.O. Box 541
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I hereby further certify that I have this date served one copy upon each of the following parties, of the foregoing **RESPONSES OF ZERO EMISSIONS LEASING LLC TO INFORMATION REQUESTS OF PUBLIC UTILITIES COMMISSION, DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM,**

HECO COMPANIES AND TAWHIRI POWER LLC in Docket No. 2008-0273, by causing each such copy thereof to be sent via e-mail in a portable document format ("pdf") to each such party as follows:

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